ISSN 2319 – 5746 EISSN 2319 – 5754

Species

Species Research information 001: Checklist of catfishes (Osteichthyes: Siluriformes); New frogs (Anura: Terrarana); mite family Phytoseiidae; species of the subfamily Triatominae Jeannel, 1919; phylogeny and classification of the Empidoidea (Diptera); checklist of the rotifers (Phylum Rotifera); Palaearctic lizard tribe Lacertini (Squamata: Lacertidae: Lacertinae); Lepidoptera phylogeny and systematic; Order Trichoptera Kirby 1813 (Insecta); revision of Orthoptera sensu nov. and sister groups

Department of Species Informatics, Species (journal)

Species (journal), Discovery Publication, Tamil Nadu, India

Citation

Department of Species Informatics, Species (journal). Species Research information 001: Checklist of catfishes (Osteichthyes: Siluriformes); New frogs (Anura: Terrarana); mite family Phytoseiidae; species of the subfamily Triatominae Jeannel, 1919; phylogeny and classification of the Empidoidea (Diptera); checklist of the rotifers (Phylum Rotifera); Palaearctic lizard tribe Lacertini (Squamata: Lacertidae: Lacertinae); Lepidoptera phylogeny and systematic; Order Trichoptera Kirby 1813 (Insecta); revision of Orthoptera sensu nov. and sister groups. *Species*, 2014, 11(27), 20-23

Checklist of catfishes, recent and fossil (Osteichthyes: Siluriformes), and catalogue of siluriform primary types
CARL J. FERRARIS, JR. (USA)
Zootaxa 1418: 1-628

A checklist of Recent and fossil catfishes (Order Siluriformes) is presented, summarizing taxonomic literature published through 2005. From 4624 nominal species group names and 810 genus group names, 3093 species are recognized as valid, and are distributed among 478 genera and 36 families. Distributional summaries are provided for each species, and nomenclatural synonymies, including relevant information on all name-bearing types, are included for all taxa. One new name is proposed herein: *Clariallabes teugelsi*, as a replacement for *Clarias (Allabenchelys) dumerili longibarbis* David & Poll, 1937, which is preoccupied by *Clarias longibarbis* Worthington, 1933, but has been treated as a valid species of *Clariallabes* by Teugels. *Acrochordonichthys melanogaster* Bleeker, 1854, is designated as type species of *Acrochordonichthys* Bleeker, 1857, inasmuch as no earlier valid designation has been found. A new genus *Pseudobagarius*, is proposed for the "*pseudobagarius* group" of species formerly placed in Akysis. The status of 228 species group names remains unresolved and 31 names based on otoliths ascribed to catfishes are listed but not placed into the checklist. The current emphasis given to catfish taxonomy at present is likely to result in a dramatic increase in the total number of valid taxa as well as major changes in the membership of some of the higher level taxa recognized here.

New World direct-developing frogs (Anura: Terrarana): Molecular phylogeny, classification, biogeography, and conservation
S. BLAIR HEDGES, WILLIAM E. DUELLMAN, & MATTHEW P. HEINICKE (USA)
Zootaxa 1737: 1-182

New World frogs recently placed in a single, enormous family (Brachycephalidae) have direct development and reproduce on land, often far away from water. DNA sequences from mitochondrial and nuclear genes of 344 species were analyzed to estimate their relationships. The molecular phylogeny in turn was used as the basis for a revised classification of the group. The 882 described species are placed in a new taxon, Terrarana, and allocated to four families, four subfamlies, 24 genera, 11 subgenera, 33 species series, 56 species groups, and 11 species

subgroups. Systematic accounts are provided for all taxa above the species level. Two families (Craugastoridae and Strabomantidae), three subfamilies (Holoadeninae, Phyzelaphryninae, and Strabomantinae), six genera (*Bryophryne, Diasporus, Haddadus, Isodactylus, Lynchius, and Psychrophrynella*), and two subgenera (*Campbellius and Schwartzius*) are proposed and named as new taxa, 13 subspecies are considered to be distinct species, and 613 new combinations are formed. Most of the 100 informal groups (species series, species groups, and species subgroups) are new or newly defined. *Brachycephalus* and *Ischnocnema* are placed in Brachycephalidae, a relatively small clade restricted primarily to southeastern Brazil. Eleutherodactylidae includes two subfamilies, four genera, and five subgenera and is centered in the Caribbean region. Craugastoridae contains two genera and three subgenera and is distributed mainly in Middle America. Strabomantidae is distributed primarily in the Andes of northwestern South America and includes two subfamilies, 16 genera, and three subgenera. Images and distribution maps are presented for taxa above the species level and a complete list of species is provided. Aspects of the evolution, biogeography, and conservation of Terrarana are discussed.

A revised catalog of the mite family Phytoseiidae
G.J. DE MORAES (Brazil), J.A. MCMURTRY (USA), H.A. DENMARK (USA) & C.B. CAMPOS (Brazil)
Zootaxa 434: 1-494

Mites of the family Phytoseiidae are the most common predators of phytophagous mites on most plant species. Some species are widely studied and used for the biological control of mite pests. Many new species continue to be discovered as collections are intensified in certain regions or habitats, e.g. in Africa, Asia, Central and South America. The last catalog of Moraes et al. (1986) included about 1500 described species. This updated catalog includes almost 2250 species. As in the last catalog, it includes references to descriptions and redescriptions of species, synonymies and recorded world distributions.

A checklist of the current valid species of the subfamily Triatominae Jeannel, 1919 (Hemiptera, Reduviidae) and their geographical distribution, with nomenclatural and taxonomic notes
C. GALVÃO, R. CARCAVALLO, D. DA S. ROCHA & J. JURBERG (Brazil)
Zootaxa 202: 1-36 (2003)

A checklist of the 137 current valid species placed in the subfamily Triatominae and their geographical distribution is presented. Confirmed and doubtful synonyms are given, as are nomenclatural and taxonomic comments.

The morphology, higher-level phylogeny and classification of the Empidoidea (Diptera)
B.J. SINCLAIR (Germany) & J.M. CUMMING (Canada)
Zootaxa 1180: 1-172

A cladistic analysis of the Empidoidea and basal lineages of the Cyclorrhapha, based on morphological characters, confirms the monophyly of both groups as well as that of the Eremoneura. The resulting final trees are used to revise the classification of the Empidoidea to include the following five families: Empididae, Hybotidae, Atelestidae (including Nemedininae n. subfam.), Brachystomatidae rev. stat. (comprising the subfamilies Brachystomatinae, Ceratomerinae and Trichopezinae), and Dolichopodidae *s.lat*. The family Microphoridae is not recognized, and the Microphorinae and Parathalassiinae are assigned to the Dolichopodidae *s.lat*. The Dolichopodidae *s.str*. includes 15 subfamilies that were previously recognized within the family. Within the Empidoidea we found support for Atelestidae as the sister group to the Hybotidae and for the monophyly of Parathalassiinae + Dolichopodidae *s.str*. The Empididae remains poorly defined and the genera Homalocnemis Philippi, *Iteaphila* Zetterstedt, *Anthepiscopus* Becker, and *Oreogeton* Schiner are classified as *incertae sedis* within the Empidoidea. In addition, the following higher taxa are proposed: Symballophthalmini n. tribe, Bicellariini n. tribe, Oedaleinae rev. stat., and Trichininae rev. stat., which are all assigned to the Hybotidae. The genus *Sematopoda* Collin is tentatively assigned to Trichopezinae, and Xanthodromia Saigusa is transferred from Hemerodromiinae to Brachystomatinae. All morphological characters are extensively discussed and illustrated, including details of the antennae, mouthparts, internal thoracic structures, wings, and male and female terminalia. In addition, a key to families and unplaced genus groups of the Empidoidea is provided. Feeding habits are also discussed in terms of the empidoid ground plan condition.

Annotated checklist of the rotifers (Phylum Rotifera), with notes on nomenclature, taxonomy and distribution
HENDRIK SEGERS (Belgium)
Zootaxa 1564: 1-104

Phylum Rotifera comprises about 2030 known species classified in three main groups, the marine Seisonida (3 species), the Monogononta (1570 species) and the unique, exclusively parthenogenetic Bdelloidea with 461 clonal species. Here I present an annotated checklist of the taxon, giving the global distribution of the valid species. This checklist contains over 3,000 available names at the genus- and species-group

Department of Species Informatics, Species (journal),
Species Research information 001,
Species, 2014, 11(27), 20-23,

level, including valid names and a non-comprehensive list of synonyms. A number of taxonomic and nomenclatural suggestions following from the review is presented. Suggestions include several new synonyms and two *nomina nova*: *Dissotrocha kostei for Dissotrocha aculeata* Koste, 1996 non Ehrenberg, 1838 (*stat. nov., ex. Dissotrocha hertzogi aculeata*) and *Lepadella zigzag* for *Lepadella bractea* Myers, 1934 non (Ehrenberg, 1838). This contribution also describes features of an on-line, global names database of the Rotifera, on which this checklist is based.

Systematics of the Palaearctic and Oriental lizard tribe Lacertini (Squamata: Lacertidae: Lacertinae), with descriptions of eight new genera
E. NICHOLAS ARNOLD (UK), OSCAR ARRIBAS (Spain) & SALVADOR CARRANZA (Spain)
Zootaxa 1430: 1-86

DNA sequence indicates the Lacertidae contain two subfamilies, Gallotiinae and Lacertinae, the latter comprising two monophyletic tribes, the Eremiadini of Africa and arid southwest and central Asia, and the Lacertini of Europe, north-west Africa and southwest and east Asia. Relationships within the 108 species of Lacertini are explored using mtDNA (291 bp cytochrome b; 329 bp 12S rRNA for 59 nominal species, and reanalysis of the data of Harris et al. 1998, and Fu 2000). The morphology of the tribe is reviewed and 64 of its characters (equivalent to 83 binary ones) also used to assess relationships. The Lacertini are assigned to 19 monophyletic units of 1 to 27 species, recognised here as the following genera (contents are indicated in brackets): *Algyroides, Anatololacerta* gen. nov. (*L. danfordi* group), *Apathya* (*L. cappadocica* group), *Archaeolacerta* (*L. bedriagae*), *Dalmatolacerta* gen. nov. (*L. oxycephala*), *Darevskia* (*L. saxicola* group), *Dinarolacerta* gen. nov. (*L. mosorensis*), *Hellenolacerta* gen. nov. (*L. graeca*), Iberolacerta (*L. monticola* group), *Iranolacerta* gen. nov. (*L. brandtii* and *L. zagrosica*), *Lacerta* s. str. (sand and green lizards, *L. agilis* group), *Parvilacerta* gen. nov. (*L. parva* and *L. fraasii*), *Phoenicolacerta* gen. nov. (*L. laevis* group), *Podarcis* (wall lizards), *Scelarcis* (*L. perspicillata*), *Takydromus* (Asian grass lizards), *Teira* (*L. dugesii*), Timon (ocellated lizards, *L. lepida* group) and *Zootoca* (*L. vivipara*). Both mtDNA and morphology indicate that *Lacerta* and *Timon* are sister taxa, and DNA suggests further possible relationships among genera (Fig. 1, p. 6). Neither DNA nor morphology indicates that the archaeolacertas (sometimes formalised as *Archaeolacerta* sens. lat.) form a clade. Instead, they are representatives of an ecomorph associated with living on rock exposures and using the narrow crevices that these contain.

The Lacertidae probably arose in the European area, with the Gallotiinae later reaching Northwest Africa and the Canary Islands, and the ancestor of the Eremiadini invading Africa in the mid-Miocene. The Lacertini spread through much of their present European range and diversified, perhaps largely by repeated vicariance, around 12–16 My ago, producing the ancestors of the present mainly small-bodied genera, which then underwent often modest speciation. Three units spread more widely: the *Lacerta-Timon* clade of large-bodied lizards probably dispersed earliest, followed by *Algyroides* and then *Podarcis*. Overall, European Lacertidae show a pattern of repeated spread, often accompanied by restriction of previous groups. Expansion of Lacertini may have displaced earlier lacertid lineages from all or much of Europe; while spread of *Podarcis* may have restricted many other genera of Lacertini. The earlier expansion of the *Lacerta-Timon* clade probably did not have this effect, as difference in adult body size restricted competitive interaction with other forms. Several invasions of more distant areas also occurred: of East Asia by *Takydromus* over 10 My ago, and more recently of northwest Africa by *Podarcis, Scelarcis* and *Timon*, and Madeira by *Teira*.

Relationships within the Eremiadini estimated from both mtDNA, and nDNA differ considerably from those based on morphology. They indicate relatively mesic forms may have diversified widely across Africa and given rise to at least three independent invasions of arid habitats. MtDNA also indicates that *Lacerta andreanskyi* belongs in the Eremiadini and may occupy a basal position there. It is assigned to a further new genus, *Atlantolacerta* gen. nov.

Lepidoptera phylogeny and systematics: the state of inventorying moth and butterfly diversity
NIELS P.KRISTENSEN (DENMARK), MALCOLM J. SCOBLE (UK) & OLE KARSHOLT (DENMARK)
Zootaxa 1668: 699-747

The currently recognized robust support for the monophyly of the Lepidoptera (and the superorder Amphiesmenoptera comprising Lepidoptera + Trichoptera) is outlined, and the phylogeny of the principal lineages within the order is reviewed succinctly. The state of the taxonomic inventory of Lepidoptera is discussed separately for 'micro-moths', 'macro-moths' and butterflies, three assemblages on which work has followed historically somewhat different paths. While currently there are about 160,000 described species of Lepidoptera, the total number of extant species is estimated to be around half a million. On average, just over one thousand new species of Lepidoptera have been described annually in recent years. Allowing for the new synonyms simultaneously established, the net increase in species numbers still exceeds 800/year. Most of the additions are foreseeable in the micro-moth grade, but even for butterflies ca 100 species are added annually. Examples of particularly interesting new high-rank taxa that have been described (or whose significance has become realized) since the middle of the 20th century include the non-glossatan lineages represented by *Agathiphaga* and *Heterobathmia* and the heteroneuran families Andesianidae, Palaephatidae, Hedylidae and Micronoctuidae. Some thoughts on how present and future systematic lepidopterology might be prioritised are presented.

Department of Species Informatics, Species (journal),
Species Research information 001,
Species, 2014, 11(27), 20-23,

Order Trichoptera Kirby 1813 (Insecta), Caddisflies
RALPH W. HOLZENTHAL, ROGER J. BLAHNIK, AYSHA L. PRATHER & KARL M. KJER (USA)
Zootaxa 1668: 639-698
The taxonomy, diversity, and distribution of the aquatic insect order Trichoptera, caddisflies, are reviewed. The order is among the most important and diverse of all aquatic taxa. Larvae are vital participants in aquatic food webs and their presence and relative abundance are used in the biological assessment and monitoring of water quality. The species described by Linnaeus are listed. The morphology of all life history stages (adults, larvae, and pupae) is diagnosed and major features of the anatomy are illustrated. Major components of life history and biology are summarized. A discussion of phylogenetic studies within the order is presented, including higher classification of the suborders and superfamilies, based on recent literature. Synopses of each of 45 families are presented, including the taxonomic history of the family, a list of all known genera in each family, their general distribution and relative species diversity, and a short overview of family-level biological features. The order contains 600 genera, and approximately 13,000 species.

Venation pattern and revision of Orthoptera sensu nov. and sister groups. Phylogeny of Palaeozoic and Mesozoic Orthoptera *sensu nov.*
O. BÉTHOUX & A. NEL (France)
Zootaxa 96: 1-88 (2002)

After the revision of several fossils and observations of recent taxa, we propose a new interpretation of the wing venation pattern for the 'orthopteroid lineage'. The Orthoptera and several taxa previously assigned to the paraphyletic group 'Protorthoptera' are included in a common clade, Archaeorthoptera *taxon nov*. The Orthoptera and some closest relative groups are included in the Panorthoptera *sensu nov*. These assignments are based on new autapomorphies based on venation patterns. A cladistic phylogenetic analysis of the Orthoptera is performed for the first time on the fossil record of this group, based on 74 characters (131 informative states). Three taxa assigned to the Archaeorthoptera nec Panorthoptera compose the outgroup. The ingroup is composed of three Panorthoptera nec Orthoptera and 63 Orthoptera, mainly from the Palaeozoic and Mesozoic. Following this initial phylogeny, we propose several nomenclatural changes; the Ensifera are redefined and the relationships between Caelifera and Ensifera *sensu nov*., and those between the major clades of modern Ensifera *sensu nov*., are clarified. Relationships within the 'oedischioid' stem-group remain unclear. The evolution of the venational structures within the Orthoptera is discussed and in this analysis the Orthoptera were not clearly affected by the Permo-Triassic biodiversity "crisis". The capacity of the fossil taxa to be used in phylogenetic analyses is discussed, using the example of the 'orthopteroid' insects.

Department of Species Informatics, Species (journal),
Species Research information 001,
Species, 2014, 11(27), 20-23,